



Workshop on Promoting Education, Training and Skills across the Bioeconomy

What is the EU's understanding of the Bioeconomy.....

All sectors & systems that use / produce/ process / are driven by biological resources

- Ecosystems on land and sea
- Primary production systems - agriculture, forestry, aquaculture / fisheries – **incl. waste/side streams**
- Food, feed, fibres, bio-based industry, fuels and bio-energy



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• **Communication on Bioeconomy – 2012**

To pave the way to a more innovative, resource efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection.

Food security, sustainable management of natural resources, climate change mitigation, reduced fossil-dependence, jobs creation and EU competitiveness



• **Review of Bioeconomy Strategy – 2017**

good delivery, objectives still relevant, increasing importance, more focussed actions for evolved context (SDGs, renewed industrial policy, circular economy, ...)



**A sustainable bioeconomy for Europe:
Strengthening the connection between economy, society
and the environment in the EU**



...was developed jointly across different DGs
RTD, AGRI, ENV, MARE, GROW, JRC, CLIMA

The updated Bioeconomy Strategy aims to

Link the sustainable use of renewable biological resources for food, feed, bio-based products and bioenergy, with the protection and restoration of biodiversity, ecosystems and natural capital across land and water.

Step up action to ensure that the Bioeconomy provides a long-term balance of social, environmental and economic gains.



Bioeconomy Strategy: three Areas of Action

1

STRENGTHEN AND SCALE-UP THE BIO-BASED SECTORS, UNLOCK INVESTMENTS AND MARKETS

2

DEPLOY LOCAL BIOECONOMIES RAPIDLY ACROSS EUROPE



Promote education, training and skills across the bioeconomy

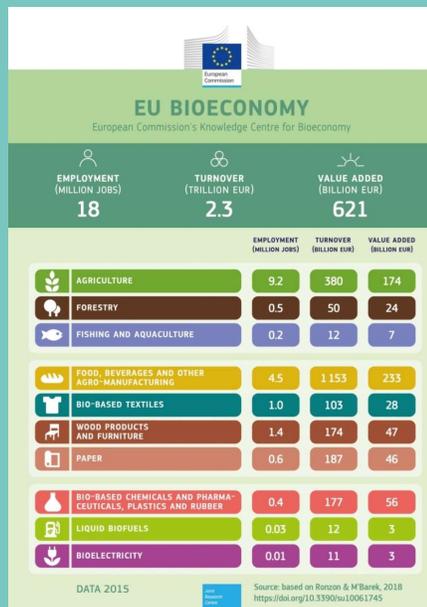
3

UNDERSTAND THE ECOLOGICAL BOUNDARIES OF THE BIOECONOMY

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Human capital in the EU Bioeconomy



~8.2% of the EU's workforce

~75% employed in agriculture, food and drink industry

High job creation potential, in rural, coastal and urban areas, through the growing participation of primary producers and deployment of bio-based solutions

In the bio-based industries one million new jobs could be created by 2030

Education and training plays a key role in realizing this potential by providing necessary skills and improving human capacity for bioeconomy



Action 2.4. Promoting education, training and skills across bioeconomy – goals and objectives

1. Map personnel structures and existing skill sets, as well as those foreseen to be needed for 2030 and 2050 in relevant bioeconomy sectors.
2. Deliver up-to-date skills intelligence on the occupations in bioeconomy and specific occupational core profiles, based on which bioeconomy vocational core curricula and teaching and training methods will be updated and new vocational core curricula in bioeconomy established.
3. Support collaborative networks, involving academic educational institutes (Higher Education Institutions) that have or are preparing bioeconomy Bachelors' degrees, Masters' degrees and / or doctoral programmes, as well as the private sector.
4. Collect and share best practice and to organise information for the development of bioeconomy curricula in higher education.
5. Promote an entrepreneurial mind-set and culture for the bioeconomy.



Action 2.4. Promoting education, training and skills across bioeconomy – implementation

1. EC workshop on education for bioeconomy – October 2019
2. Study Bioeconomy Skill Gap Analysis – 2020
3. Study Bioeconomy University Curricula – 2020
4. Blueprint for Sectoral Cooperation in Bioeconomy, new technologies and innovation in agriculture in the framework of the EU Erasmus+ programme



Agenda – Morning Part - 9:30 – 12:00

9:30	<p>Welcome and introduction ¶</p> <p>European Commission ☐</p>
9:45-10:45	<p>Session I. Part I. Presentations of the current initiatives and EU funded projects. ¶</p> <ul style="list-style-type: none"> · Preliminary mapping of skill gaps and related educational programmes across bioeconomy. Results from EU funded projects. (UrBiofuture, Askfood, BioEnergyTrain, Blueprint on sectoral cooperation on skills for Bio-economy, new technologies & innovation in agriculture) ¶ · Q&A ☐
10:45-11:00	<p>Coffee break ☐</p>
11:00-12:00	<p>Session I. Part II. Presentations of the current initiatives and EU funded projects. ¶</p> <ul style="list-style-type: none"> · Industry perspective on the challenges and approaches towards developing skills for bioeconomy. (Metsä-Group, RethinkResources). ¶ · ¶ · The bioeconomy and a future biobased food industry and agriculture sector: How can workers' organisations shape the change? (EFFAT). ¶ · ¶ · Supporting Regions in the design of innovative bioeconomy educational paths: The contribution of the European Bioeconomy Network and Biovoices project. ¶ · Q&A ☐
12:00-13:30	<p>Lunch break ☐</p>

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Agenda - Afternoon Part – 13:30 – 17:30

13:30-14:30	<p>Session II. Part I. Interactive discussion (World-Café format) ¶</p> <p>Breakout groups' discussion and reporting on key issues identified during the mapping of the current initiatives and EU funded projects in the area of education for bioeconomy. ☐</p>
14:45-15:00	<p>Coffee break ☐</p>
15:00-16:45	<p>Session II. Part II. Interactive discussion (World-Café format) ¶</p> <p>Breakout groups' discussion and reporting on key issues identified during the mapping of the current initiatives and EU funded projects in the area of education for bioeconomy. ☐</p>
16:45-17:30	<p>Closing remarks and final discussion ☐</p>

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Thank you !



For more information, please visit our website: <https://ec.europa.eu/research/bioeconomy/index.cfm>

Actions

1

STRENGTHEN AND SCALE-UP THE BIO-BASED SECTORS, UNLOCK INVESTMENTS AND MARKETS



Mobilise stakeholders in development and deployment of sustainable bio-based solutions



Launch the **EUR 100 million** Circular Bioeconomy Thematic **Investment Platform**



Analyse enablers and bottlenecks for the deployment of **bio-based innovations**



Promote and develop **standards, labels and market uptake of bio-based products**



Facilitate the **development of new sustainable biorefineries**



Develop substitutes to fossil based materials that are **bio-based, recyclable and marine biodegradable**

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Actions

2

DEPLOY LOCAL BIOECONOMIES RAPIDLY ACROSS EUROPE



Launch a **Strategic Deployment Agenda** for sustainable food and farming systems, forestry and bio-based products



Launch **pilot actions for the development of bioeconomies** in rural, coastal and urban areas



Support **regions and Member States** to develop Bioeconomy Strategies



Promote **education, training and skills** across the bioeconomy

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Actions

3

UNDERSTAND THE ECOLOGICAL BOUNDARIES OF THE BIOECONOMY



Enhance **knowledge** on biodiversity and ecosystems



Monitor **progress** towards a sustainable bioeconomy



Promote **good practices** to operate the bioeconomy within **safe ecological limits**

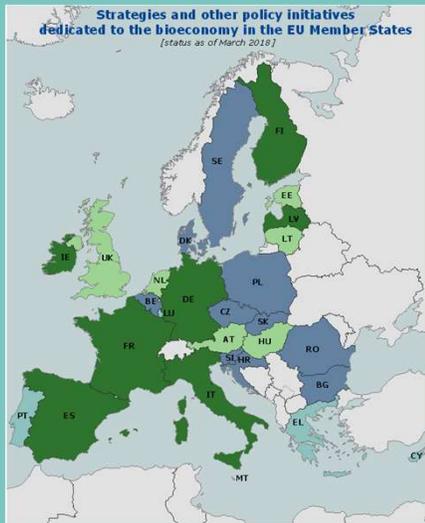


Enhance the **benefits** of biodiversity in **primary production**

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Bioeconomy in the EU - Great diversity...wide variety.....



- **9 MS have a dedicated bioeconomy strategy**

Finland, Latvia, Germany, Italy, France, Spain, Ireland, UK, AT

- **5 MS in the process of developing a strategy**

Estonia, Hungary, Lithuania, the Netherlands, Sweden

- **11 CEE MS plan to develop one under BIOEAST initiative**

Bulgaria, Croatia, Czechia, Hungary, Poland, Romania, Slovakia, Slovenia, Estonia, Lithuania, Latvia

- **>50 regions have a bioeconomy-related strategy**

- **A few cities have bioeconomy-related priorities in their policies**

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Key features of the updated strategy

- **A SYSTEM-wide approach,**
- **Expanding beyond research and innovation,**
- **Delivering on policies across sectors, addressing trade-offs**
- **A strong focus on SUSTAINABILITY and CIRCULARITY**
- **Delivering for the citizens - on jobs, sustainable growth, well being....**
- **...in particular in rural areas, through better cooperation and coordination at EU, national and rural level**
- **A set of well defined actions including...**
- **...a well defined monitoring system with clear indicators**

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Workshop
Promoting Education, Training and Skills across the
Bioeconomy

Alliance for Skills and Knowledge to Widen Food Sector-related Open Innovation, Optimization and Development ASKFOOD

Paola Pittia (project coordinator)
University of Teramo (Italy)
ppittia@unite.it

Bruxelles
15 Oct
2019

1^o January 2018-31^o December 2020
Project N. 588375-EPP-1-2017-1-IT-EPPKA2-KA



www.askfood.eu



Food value chain & main stakeholders

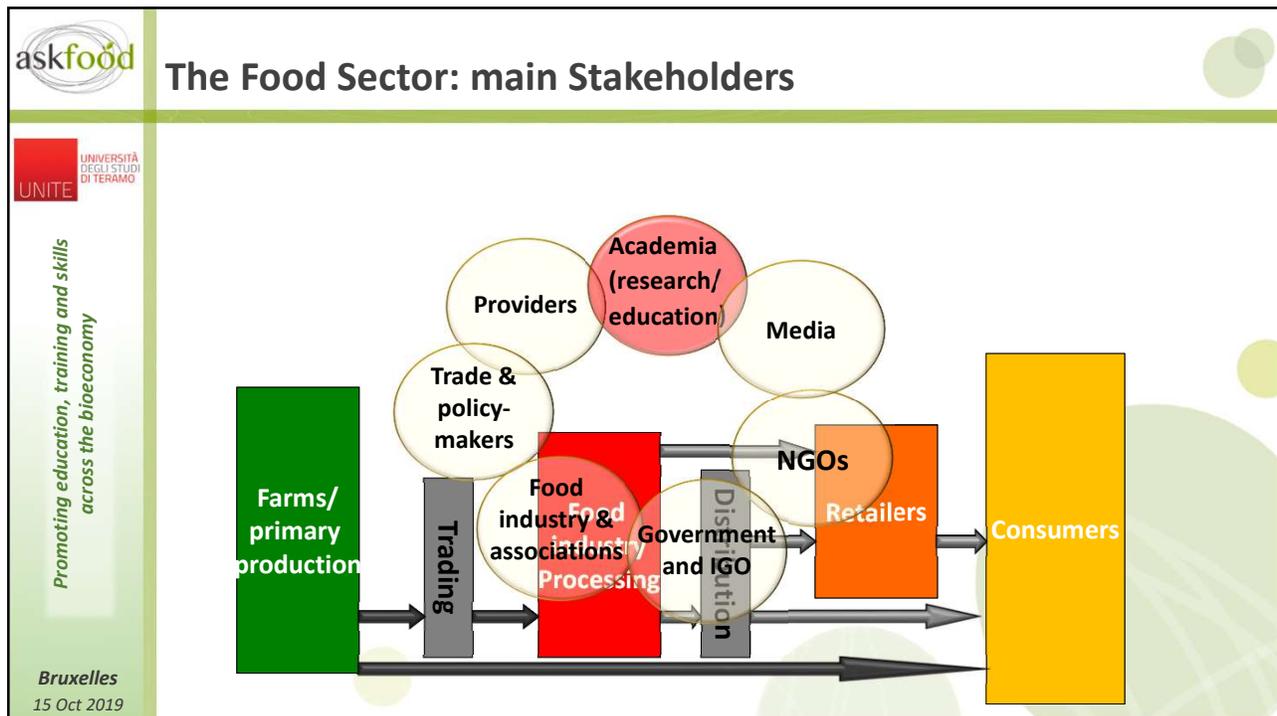
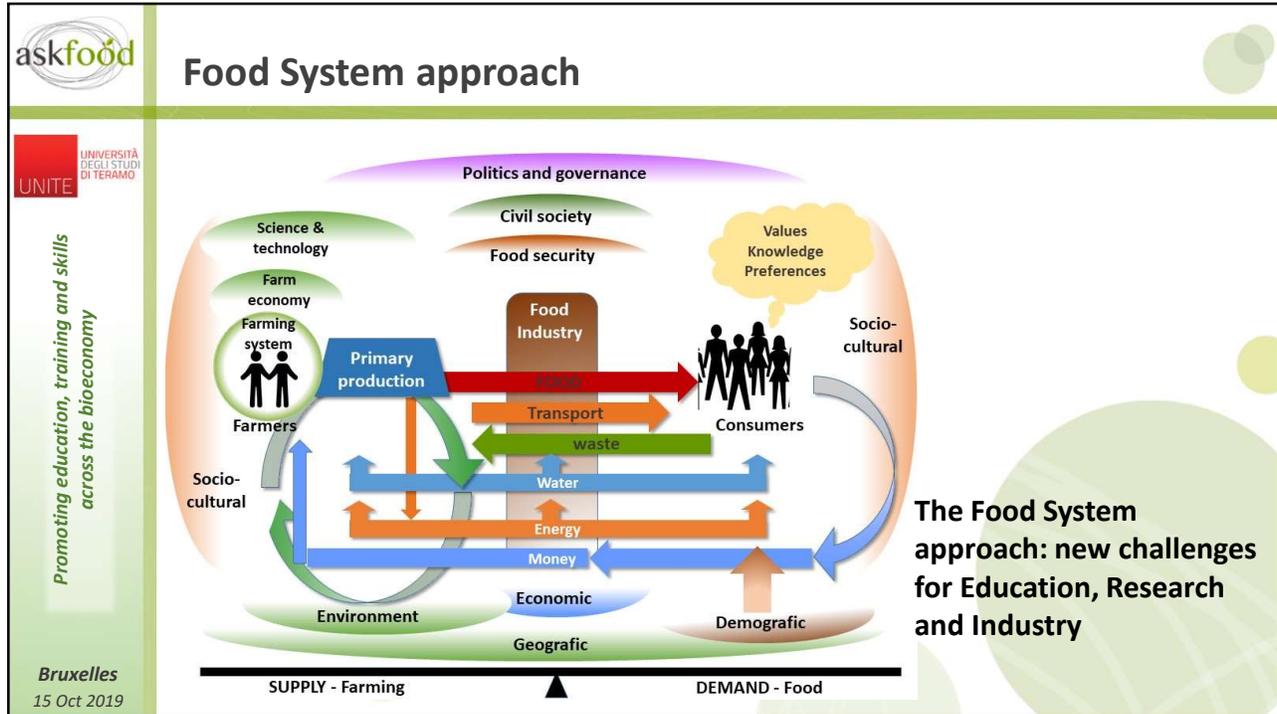


Promoting education, training and skills
across the bioeconomy



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askfood HE in a challenging and evolving food system

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Promoting education, training and skills across the bioeconomy

Environment and Society

Science & Technology

Advancements Digitalisation
New interfaces with non-food science

Users (students)

'Millennials generation'
'post-Millennials (Z-generation)

NEED to upgrade and modernize training and educational methodologies in the food-related sectors

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NEW COMPETENCES

NEW SKILLS

NEW JOBS

NEW INTERFACES

Mega trends in HE

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15 Oct 2019



New «food –related» professions



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The Growing need of intercepting major changes driven by innovation that is resulting in the emergence of new professions **y for**

Digital techn... greatest food... and r...
...ly World - the turning more... ll sets.

NEED of leverage of innovative and entrepreneurial mindset of the future generation of graduates and the food-related studies



The Innovation Models



Promoting education, training and skills across the bioeconomy

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GOVER

RESE (know...)

ence

NEED of improvement of academia-industry and stakeholders interplay in a Quintuple Helix innovation model

askfood

The ASKFOOD project aims

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Promoting education, training and skills across the bioeconomy

The Erasmus + KA ASKFOOD project main aim is to create a permanent knowledge alliance between businesses and HEIs in the food-related sectors



NEED to upgrade and modernize training and educational methodologies in the food-related sectors

NEED of leverage of innovative and entrepreneurial mindset of the future generation of graduates and the food-related studies

NEED of improvement of academia-industry and stakeholders interplay in a Quintuple Helix innovation model.

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The «Double Path» approach of ASKFOOD

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Promoting education, training and skills across the bioeconomy



Anticipate
Using foresight and scenarios to forecast trends and related skills

Analyse and Activate
Map consistency in training and start the alliance for innovative training design

Know
Observatory and Open Evaluation + decision support system

Knot-up
innovative training investment, Open Business Ecosystem and ASKFOOD Alliance

Share and stimulate
Launch Joint Innovative and Blended Training Packages

Support
Virtual Incubator and Growth Hacking Programmes based on reverse incubation + Ambassador Institutions

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Outcomes and innovative products



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	<p>Smart Atlas Forecast aggregator</p>	<p>Virtual tools based on the TEMPESTS model: scenarios, skills and training identifier, competences, professions</p>
	<p>Knowledge and Training hubs</p>	<p>Cross-industry knowledge platforms to support innovative multi-actor food clusters</p>
	<p>Digital Business & Technology Environment</p>	<ul style="list-style-type: none"> Innovative learning and teaching methods Test Open Innovation Methodologies (ASKFOOD Labs, Virtual Incubator) Certification of skills
	<p>Observatory</p>	<p>Multisectorial and multidisciplinary environment to share and discuss issues about education and training</p>

Target: HE students and trainees, raining providers, businesses, enterprises



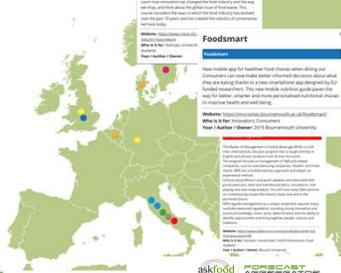
Solutions? New skills for new jobs



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The SMART ATLAS





The Forecast Aggregator (TEMPESTS model)

Interactive Gap identifier
(under construction)

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Consortium

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Promoting education, training and skills across the bioeconomy



6 Universities

2 research and consulting companies (P7, P8)

3 Food industry associations (P9, P10, P11)

1 non-profit Food organisation (P12)

From EU to an international dimension

Bruxelles

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Our Dream

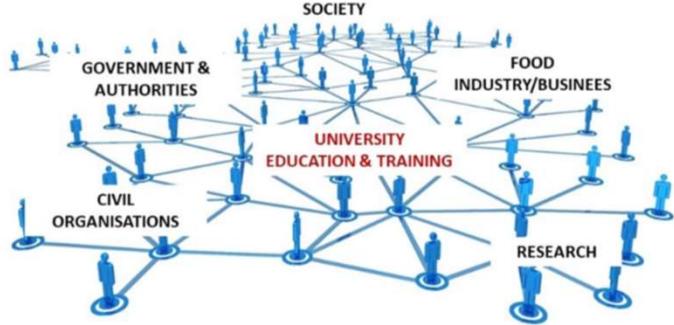
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To contribute to.....

RESPONSIBLE RESEARCH, INNOVATION AND EDUCATION IN THE FOOD & FOOD –RELATED SECTORS



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15 Oct 2019




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across the bioeconomy

Thanks

www.askfood.eu



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Erasmus+ Programme
of the European Union

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Promoting education, training and skills across the
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BioEnergyTrain

How to get involved?

Brigitte Hasewend, eseia Director

Brussels, 15.10.2019



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research and innovation programme under grant agreement N 656760



Agenda:

1. *What has BET achieved?*
2. *Why is there a need to get involved?*
3. *Which cooperation models do we offer?*
4. *Sustainability challenge*
5. *How can you get involved?*



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Our aim

Transfer BET cooperative educational formats and training materials to a larger number of educational institutions and business actors in order to meet the human resource requirements for implementing the SET-Plan **Education and Training Roadmap for Energy Transition.**



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1. What has been achieved? Cooperative Educational Formats

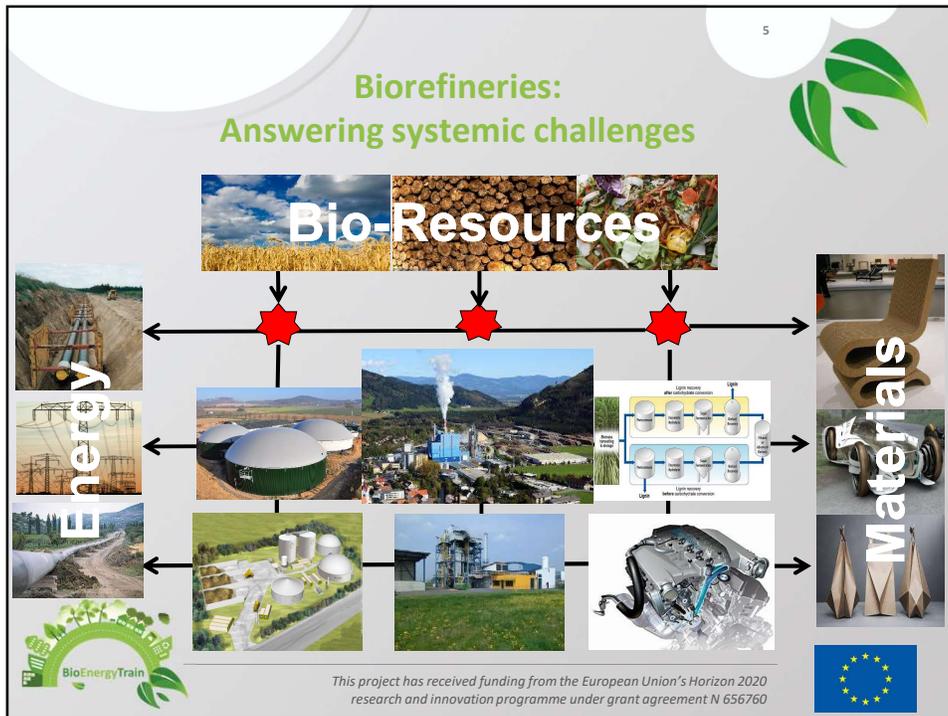
The following BET cooperative educational formats have been developed and implemented to become role-models for practice-oriented education:

- 2 Master Curricula (BRE and BVM)**
 - [Biorefinery Engineer \(BRE\): Modular Structure](#)
 - [Bioresource Value Chain Manager \(BVM\): Modular Structure](#)
 - 100 students are involved within the two BET Master Programmes already
- 19 BET Courses**
 - Available on TU Graz Moodle and e-learning Platform
 - For more information, please contact: office@eseia.eu
- Professional Educational Formats** (Interdisciplinary Student Camp, International Summer School, Pilot Plant Course, Vocational Trainings, Internship, Master thesis). [The Professional Educational Formats are implemented under the eseia ETP.](#)
 - In total BET realised 8 Professional Education Format and 1 is to come
 - 150 Student involved



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6

Biorefineries and European policy

- Top priority in Europe and Horizon 2020's most prominent theme
- Biorefinery technologies are the backbone of several important European policies and projects, e.g.
 - European Bioeconomy Strategy
 - Strategic Energy Technology Plan Roadmap (SET-Plan)
 - IEA Biorefinery Task 42
- Novel biorefinery pathways, required to reduce humanity's carbon footprint, are an urgent and critical need, which is reliant upon a flow of qualified persons

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The two BET Curricula

Biorefinery Engineering Curriculum

- Module 5: Biorefinery economic, ecological and social aspects
- Module 3: Biorefinery technologies
- Module 1: Biorefinery Engineering basics
- Module 2: Chemical and analytical aspects of bio-refineries
- Module 4: Biorefinery and energy systems
- Module 5: Biorefinery economic, ecological and social aspects

Bioresource Value Chain Manager Curriculum

- Module 1: The Bioresource value chain as a flow of biomass resources
- Module 4: The Bioresource value chain optimization and innovation
- Module 3: Biorefinery technologies
- Module 2: The Bioresource value chain as a network of interconnected technologies and products
- Module 3: The Bioresource value chain as a flow of economic transactions
- Module 4: The Bioresource value chain optimization and innovation

- Modular architecture to allow integration into existing programs
- Openly accessible teaching material
- Network of course authors from academia and business
- Innovative „cooperative education and training formats“

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1. Cooperation Models for Industry and Regional Actors (in cooperation with WP 3 and 4)

Get involved in the curriculum:

- BET Alternative Learning Formats
- Host a technical site visit
- Give guest lectures for BET-students
- Provide internships

Participate in qualification actions:

- Take up nuggets for own trainings
- Vocational Education Training Courses (for interested associations)
- Life Long Learning Course (planned)

Thinking outside the box:

- Define a case study
- Host student projects
- Host a master thesis

Train your future employees

Train your current employees

Live Open Innovation

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Industry/Regional cooperation BRE Master at TU Graz

- Industry excursions
- Biorefinery Project: Real life project based on industrial / regional challenge
- Lecture „Selected Topics of Biorefinery Topics – Industrial Issues“:
Lecture series by industrial partners (Mondi, Sappi, Heinzl Group, BDI.....) planned for 2018/19
- Master thesis research in collaboration with industry ongoing



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WP 2

Bioresource Value Chain Manager Master Curriculum Development

UNIVERSITY OF TWENTE. HIGH TECH HUMAN TOUCH

Dr. Maarten Arentsen



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BVM addresses

- The identified need of expertise on bioresource value chain management in Europe and the world
- Professionals with the ambition to manage and lead the transition to a bio-economy in Europe and the world.
- The challenge of initiating and developing new value chains out of local bioresources and turn these into sustainable economic value for regions.



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THE FIRST YEAR OF THE SET CURRICULUM

Elective part:
1-2 wild cards to replace courses for individual choice

COURSES SEPARATED INTO 4 THEMES (15 EC EACH)

THEME 1: ENERGY SOURCES	THEME 2: TECHNOLOGY & SUSTAINABILITY	THEME 3: SOCIO-ECONOMICS	THEME 4: DESIGN & SYSTEM INTEGRATION
<ul style="list-style-type: none"> • Energy from Biomass • Solar Energy • Wind Energy 	<ul style="list-style-type: none"> • Energy Conversion Tech. • Energy Storage • Life-Cycle Strategy 	<ul style="list-style-type: none"> • Energy, Sustainability & Society • System Innovation & Strategic Niche Management • Designing Business Models 	<ul style="list-style-type: none"> • Electrical Power Engineering & System Integration • Basics for Process Simulation • Thermodynamics and Flowsheeting



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UNIVERSITY OF TWENTE.



SET-BVM CURRICULUM SECOND SPECIALIZATION YEAR



Q1: (15 EC)	Q2: (15 EC)	Q3: (15 EC)	Q4: (15 EC)
<ul style="list-style-type: none"> (Regional) Economics of Bioresources 	<ul style="list-style-type: none"> Sustainable Bioresource Supply Chain Management 	<ul style="list-style-type: none"> Master thesis research in collaboration with industry 	
<ul style="list-style-type: none"> Bioresource Business Development and Management 	<ul style="list-style-type: none"> Capita Selecta BET course list 		
<ul style="list-style-type: none"> Bioresource Value Chain Optimization 	<ul style="list-style-type: none"> Integrative business project 		



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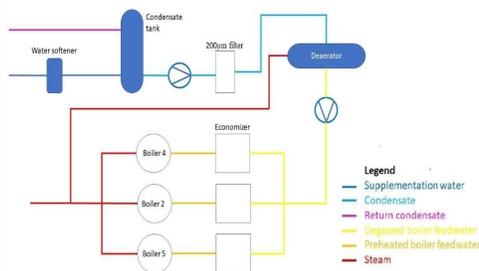
Regional economics of bioresources

- What regional qualities of a regional bio energy economy are
- Which regional qualities are important for regional economic impacts of biomass
- How physical, cultural and organizational characteristics of regions differ and what is the influence of these differences on the regional bio-economy
- How the regional bio resources and regional characteristics can be linked to regional economic impacts
- How regional qualities and resources can be analyzed from a regional economic perspective



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Exploration of a company sustainable biomass supply chain to produce steam for vulcanization sustainably



Property	Value
Boiler efficiency	89% - 92%
Maximum capacity boiler 2	12 ton/hour
Maximum capacity boiler 4	12 ton/hour
Maximum capacity boiler 5	16 ton/hour

Biomass type	Cost of cultivation [€/ton]	Land requirement [km ²]	Specific CO ₂ emission [kg/ton*year]	Specific fertilizer CO ₂ emission [kg/ton*year]	Pesticide requirement [l/ha*year]
Willow	32.37	11.2	4.0	8.6	0.7
Poplar Italian	67.55 – 92.11	8.7 – 11.9	8.8 – 12.0	10.4 – 14.1	0.8
Poplar Swedish	31.61 – 43.10	8.7 – 11.9	3.2 – 4.4	6.9 – 9.4	0.7
Miscanthus	38.11 – 50.81	6.8 – 9.0	5.0 – 6.6	5.3 – 7.0	0.3
Switchgrass	70.08 – 86.14	8.0 – 14.5	3.6 – 6.4	11.6 – 20.8	0.4
Fibre hemp	157.61 – 256.11	10.5 – 17.1	10.9 – 17.9	59.1 – 96.0	0.0



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16

Regional Challenges

SUPPLY



DEMAND



Designing and implementing demand-responsive offers



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ENERGIEAGENTUR Steiermark 17

Three main streams explored

- T4.2 - developing HEI **vocational training cooperation**



BRE / BVM
vocational training



- T4.3 - generated **regional know-how-outreach** activities



BRE / BVM
master curricula



- T4.4 - **awareness raising** on bioenergy and grid-integration



BRE / BVM awareness
raising




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eit European Institute of Innovation & Technology 18

Linking Business&HEIs

Industry host

Academia

Professional Educational Formats

42 students trained

Professional Educational Formats

Curriculum Biorefinery Engineer

Curriculum Value Chain Manager

The camp exceeded my expectations in terms of the attitude and motivation of the students, as well as the results.

Nigel Foxhall, Director Advanced Engineering, BRP

We applied our business knowledge into the real world. Meeting other students and professionals from different fields challenges our way of thinking and makes discussion progress, ground-breaking.

Vlad Milshyn, MSc Student

Lesson learnt: All stakeholders in design and implementation

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D3.1 International Summer School

- 18-29 July 2016
- 19 participants
- Hosted by LNEG in Lisbon, Portugal
- Lectures from University of Twente, KIC and Bio-C
- Focus on biorefineries
- 1 week lectures + 1 week workshops with lab exercises and computer modeling
- 3 technical site visits

D3.4 Student Camp

- 7-11 March 2016
- 23 participants
- Hosted by BRP Powertrain in Gunskirchen, Austria
- Lectures from BRP experts, TU Graz and University of Twente
- Focus on LCA



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D3.3 Pilot Plant Course 1

- 26-28 October 2016
 - 9 participants
 - Hosted by :metabolon, Lindlar, Germany
- Students had opportunity to:
- Work at pilot plant installations
 - perform experiments
 - gain valuable hands-on experiences with key technologies

D3.4 International Summer School 2

- 25 June - 2 July 2017
- 14 participants
- Hosted by University of Zagreb
- Lectures from BET Partners
- Focus on bio-resources and energy production
- 1 week lectures + 1 week workshops with lab exercises
- 2 technical site visits



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D3.5 Industrial/ Regional Student Camp

- 26 February– 2 March 2018
- 23 participants
- Hosted by EAS in Graz, Austria
- students worked independently in 4 groups on challenges, provided by regional cooperation partners

Challenges:

1. Accomplishing Climate Protection Goals
2. Biomass – Reaching The Masses
3. Circular Bio-Economy Mureck – continuously innovative
4. Bio Based Products From Municipal Solid Waste



D3.6 Pilot Plant Course 2

- 18-20 October 2017
- 11 participants
- Hosted by :metabolon, Lindlar, Germany,
- Focus on biorefineries

Students worked on:

- experiments at the pilot-scale plants
- testing and laboratory analysis
- pilot-scale plants

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D3.7 International Summer School 3

- 9-20 July 2018
- 24 participants
- Hosted by LNEG in Lisbon, Portugal
- Focus: Biorefineries's Processes and Sustainability

Highlights:

1. Technical visits to:
 1. Navigator Company, S.A.: Pulp and paper plant
 2. Algafuel: Microalgae producing company
2. Masterclass in Innovation
3. Students multidisciplinary backgrounds



D3.8 Industrial/Regional Student Camp

- 25-28 February 2019
- 9 participants
- Hosted by Wood K-Plus, Linz
- Focus on biorefineries and biobased industrial products

Students worked on:

- Materials provided by scientists and industry
- Lab testing and analysis
- Hands-on visit to Lenzing

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2. Why is there a need?

For Stakeholders:

- to create long-lasting, innovative and efficient networks on bioresource utilisation;
- to increase the number of graduates with skill sets required in the developing bioenergy sector and to fill the gap in knowledge and training as noted in the SET-Plan Roadmap on Education and Training;
- to increase the involvement of industry in higher education and vocational training;
- to generate know-how support actions for stakeholders within their regional contexts using the ability of HEIs to focus students' theses on problems of urgent regional importance.



**A total of 250 students benefit from
Cooperative Educational Formats already**



*This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement N 656760*



2. Why is there a need?

For the BET Project Results:

- To create project sustainability;
 - to increase the use of the BET course materials through the e-learning platform and TU Graz Moodle;
 - continuing development of teaching and training materials to fill gaps corresponding to emerging innovation community needs;
 - make these materials as widely available as possible;
- ***By inclusion of the materials in educational programmes of academic partners, the further development and updating of the materials will be a common and on-going effort.***



*This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement N 656760*



3. What are the cooperation models? Stakeholder Groups

- *Industry*
- *Higher Education Institutions & Research Organisations*
- *Regional Actors*
- *Vocational Training Providers*
- *Regional and Business Networks on Bioenergy*



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N 656760



3. Cooperation Models

Industry

Cooperative Educational Formats	Models
BET curricula: BRE at TU Graz; BVM at UTwente.	<ul style="list-style-type: none"> • Include the industry into developing the curricula • Provide practice-oriented education in align with the needs of the industrial actors
20 BET courses	<ul style="list-style-type: none"> • Host a technical site visit for BET students; • Organize a study case / student project • Give a guest lecture for BET students, physical or online (MOOC)
Selected nuggets	<ul style="list-style-type: none"> • Take up nuggets for own trainings
Vocational Educational Trainings	<ul style="list-style-type: none"> • Workshops / in-house seminars designed for the need of the company based on the content of curricula
Internship / Master thesis	<ul style="list-style-type: none"> • Facilitate Master Theses and internships to BET students
Interdisciplinary Student Camp	<ul style="list-style-type: none"> • Host an Interdisciplinary Student Camp • Send participants to the Student Camp
International Summer School	<ul style="list-style-type: none"> • Give a lecture at the BET Summer School • Send participants to the ISS
Pilot Plant Lab Course	<ul style="list-style-type: none"> • Host Pilot Plant Lab Course • Send participants to the PPLC
Design Case Work	<ul style="list-style-type: none"> • Provide a topic and send an expert for the project



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N 656760



3. Cooperation Models

HEIs + ROs

Cooperative Educational Formats	Models
BET curricula: BRE at TU Graz; BVM at UTwente.	<ul style="list-style-type: none"> Partnership with BET consortium for developing a multiple or joint degree programme through Erasmus + funding programme Send students to BRE and BVM programme
20 BET courses	<ul style="list-style-type: none"> Uptake BET courses or modules in own educational programme by cooperating with course developer. Send students to take part in BET courses
Selected nuggets	<ul style="list-style-type: none"> Take up nuggets for own courses
Vocational Educational Trainings	<ul style="list-style-type: none"> Workshops / in-house seminars designed for the need of the organisation
Internship / Master thesis	<ul style="list-style-type: none"> Select students for internships Define research topics for theses Organize a hub for supply and demand of internship and master thesis assignments together with industry and other relevant actors
Interdisciplinary Student Camp	<ul style="list-style-type: none"> Send lecturers to the Student Camp Select students to participate
International Summer School	<ul style="list-style-type: none"> Host BET Summer School Give lecture at BET ISS Select students to participate
Pilot Plant Lab Course	<ul style="list-style-type: none"> Select students to participate Send academic expert to supervise the experiments
Design Case Work	<ul style="list-style-type: none"> Send academic instructor to supervise the project Integrate case study at own educational programme



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3. Cooperation Models

Regional Actors

Cooperative Educational Formats	Models
BET curricula: BRE at TU Graz; BVM at UTwente.	<ul style="list-style-type: none"> Involve them in disseminating the Master programmes Use their contacts with the industry Build up a network with professors and students – solution-oriented collaboration for regional challenges in the field of bioresources Academic contact point for specific regional problems (e.g. R&D cooperation)
20 BET courses	<ul style="list-style-type: none"> Organize a study case / student project Give a guest lecture for BET students, physical or online (MOOC) Provide excursions to regional plants
Selected nuggets	<ul style="list-style-type: none"> Take up nuggets for own trainings – climate and energy model regions, European Energy Award Programme, local energy agencies and energy consultants, etc.
Vocational Educational Trainings	<ul style="list-style-type: none"> Workshops / in-house seminars designed for the need of the organisation based on the content of curricula
Internship / Master thesis	<ul style="list-style-type: none"> Facilitate Master Theses and internships to BET students
Interdisciplinary Student Camp	<ul style="list-style-type: none"> Participate at a camp As host (students take up your regional challenges) Guest lecture (interesting practical cases,...) excursions (local biorefineries, etc.) Education of (young) employees
International Summer School	<ul style="list-style-type: none"> Participate at a summer school Guest lecture (interesting practical cases,...) excursions (local biorefineries, etc.) Education of (young) employees
Pilot Plant Lab Course	<ul style="list-style-type: none"> Send participants to the PPLC Host on-site courses (e.g. local sewage sludge plant, biogas plant) for students for working on regional challenges Assessment of young, motivated employees
Design Case Work	<ul style="list-style-type: none"> Provide a topic and send an expert for the project



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N 656760



3. Cooperation Models

Vocational Training Providers (VTP)

Cooperative Educational Formats	Models
BET curricula: BRE at TU Graz; BVM at UTwente.	• Dissemination of Master programs by using the already existing programs
20 BET courses	• Create vocational trainings based on BET courses
Selected nuggets	• Integrate nuggets in own vocational trainings
Vocational Educational Trainings	• Include VETs in own VET programme
Interdisciplinary Student Camp	• Select vocational trainees to participate
International Summer School	• Give a lecture at the BET Summer School • Tailor the ISS for vocational trainees
Pilot Plant Lab Course	• Tailor the PPLC for vocational trainees and send participants
Design Case Work	• Integrate case study at own educational programme



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N 656760



3. Cooperation Models

Regional and Business Networks on Bioenergy

Cooperative Educational Formats	Models
BET curricula: BRE at TU Graz; BVM at UTwente.	• Interact with educational networks like EUA-EPUE to involve HEIs outside BET consortium
20 BET courses	• Interact with educational networks like EUA-EPUE to involve HEIs outside BET consortium
Selected nuggets	• Take up nuggets for own trainings
Vocational Educational Trainings	• Workshops / in-house seminars designed for the need of the organisation based on the content of curricula
Internship / Master thesis	• Involve companies to organise internships • Involve companies to provide the research topic of master thesis
Interdisciplinary Student Camp	• Host an interdisciplinary Student Camp
International Summer School	• Send academic or professional expert to lecture at ISS
Pilot Plant Lab Course	• To reach out and involve new partners to host PPLC
Design Case Work	• Provide a topic and send an expert from their network for the project



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N 656760



4. Sustainability

1. All materials have been successfully transferred to the TU Graz MOODLE Platform

- Authors have the possibility to update their own materials on Moodle
- Self sustaining platform maintained by the TU Graz Media Lab
- Stakeholders can get access after signing a Cooperation Agreement

2. Successful cooperative Education Formats will be continued: next Student Camp planned at Utwente in February 2020

3. Cooperation Agreement and eseia Network

- The BET Consortium has prepared a **Cooperation Agreement template** which can be adopted to agreements between the BET Consortium with **different Stakeholders**
- Options: Cooperative Learning Formats, Individual nuggets; Courses (1-19); Full package: 19 courses,
- **eseia** as an established European alliance with 33 Member organisations **will act as contact for interested stakeholders**



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4. Sustainability

4. E-Learning Repository

- KIC Inno Energy has developed the BET e-learning repository which reaches out to external stakeholders, making both the contents and the learning environment available to them.
- In addition, TU Graz have made available all materials on their **Moodle Platform** that can be accessed by all BET partners to keep the content of their courses updated beyond the project;



5. Submitting new Proposals within the Horison2020 Programme

- As a follow up to the BET Project eseia together with its network will continue exploring funding opportunities in the field of Bioenergy and E&T
- BET experience can be used further



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5. How to get involved?

- External partners will have the opportunity to **cooperate with the Consortium** and **participate in the BET Educational Formats**, which in turn will ensure sustainability of both Master Programmes in the long term.
- Setting up and signing a Cooperation Agreement (template available)
- Use **e-learning repository**



BET Buying-In Workshop (get informed/ share your experiences on BET Cooperative Educational Formats)

Industry

HEI & RO

**Buying-In in
BET**

Regional
Actors



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N 656760



Thank you!

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SSA Blueprint on sectoral cooperation on skills for Bio-economy, new technologies & innovation in agriculture

Patrizia Busato, Remigio Berruto
DISAFA – University of Turin, Italy



www.disafa.unito.it

Erasmus + Sector skill alliance blueprint

- **Lot 3 - Sector Skills Alliances for implementing a new strategic approach (Blueprint) to sectoral cooperation on skills:** This strategy has to lead to systemic and structural impact on reducing skills shortages, gaps and mismatches, as well as ensuring appropriate quality and levels of skills to support growth, innovation and competitiveness in the sector. The sectoral skills strategy must include a clear set of activities, milestones and well-defined outputs with the goal to match demand and supply of skills to support the overall sector specific growth strategy.
- **2.4 Promote education, training and skills across the bioeconomy**



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Specific blueprint sector: Bio-economy, new technologies & innovation in agriculture

- Bio-economy, circular economy and bio-based products
- Agricultural sustainability, management of natural resources and climate action
- Digital technologies, digitalization, big data and artificial intelligence

FIELDS – Addressing the current and Future skill needs for sustainability, digitalization, and the bio-Economy in agriculture: European skills agenda and Strategy

- Duration Project 4 years
- Funding 4 mio EUR
- Status: the project was selected in the ERASMUS+ call for proposals – contract not signed yet



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Road to successful innovation

- Innovation (available)
- Education (training for students, farmers, consultants)
- Entrepreneurship (business models)
- Communication (dissemination)
- FIELDS will look at Education mainly, and also to Entrepreneurship → sustainable choices for the environment and for the economy
 - Connection with agrifood industry → what market demand/offer and can buy from agriculture/forestry (product, services, byproducts)



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FIELDS partners & countries



30 partners from 12 countries

CONFAGRI, SCOOP, CONFAGRI pt, GSZ, ICOS, AC3A, CEPI, GAIA, FENACORE represents **agriculture and forestry sector**. AERES, INFOR, WUR, UNITO, UHOH, UCLM, PA, AP, FJ-BLT, LVA, EFB are offering **training and services** to farmers and foresters. Two of them (UHOH and UNITO) are involved in the **Kic EIT FOOD**.

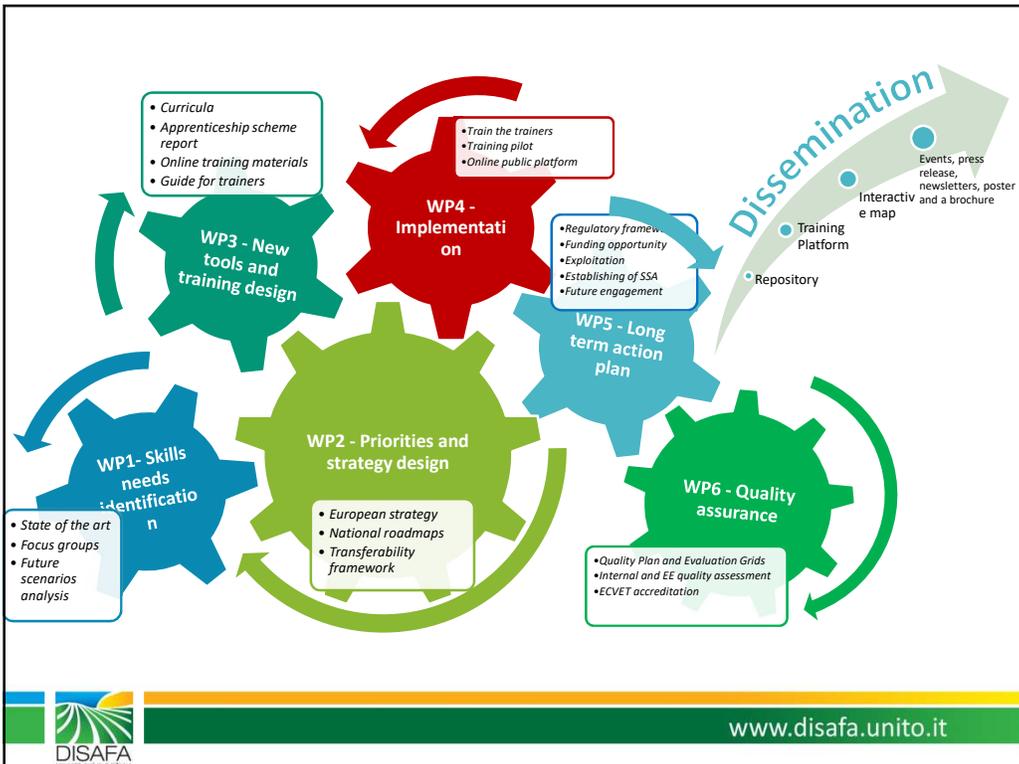
FIAB, ANIA, ACTIA, SEVT will help to involve also **food industry** in the design of the strategy and training, to make agriculture more aware of what is the demand and opportunities for sustainability, digitalisation and bio-economy from this sector.

Some of these partners (FDE, CEPI, BIC, ISEKI, EFFAT, LLL-P, EfVET, PlantETP) are **umbrella organisation at EU level**, to provide an outlook at european strategy for agriculture, forestry and agri-food industry, and link to the educational tools and standards provided by the EU.

Important support from COPA-COGECA will bring connection with stakeholders.



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High Advisory board

- Oana Neagu, COPA-COGECA
- Gert Mejers, Nestlè, Chair ETP food for life
- Kjell Ivarsson, Swedish farmer federation
- Rob J Hamer, Unilever
- Jochen Weiss, Universitat Hohenheim, Chair Education EIT FOOD
- Rafael Mujeriego, ASERSA, Catalan Water Agency
- Andras Sebok, Camden BRI Hungary



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Thank you for the attention!!

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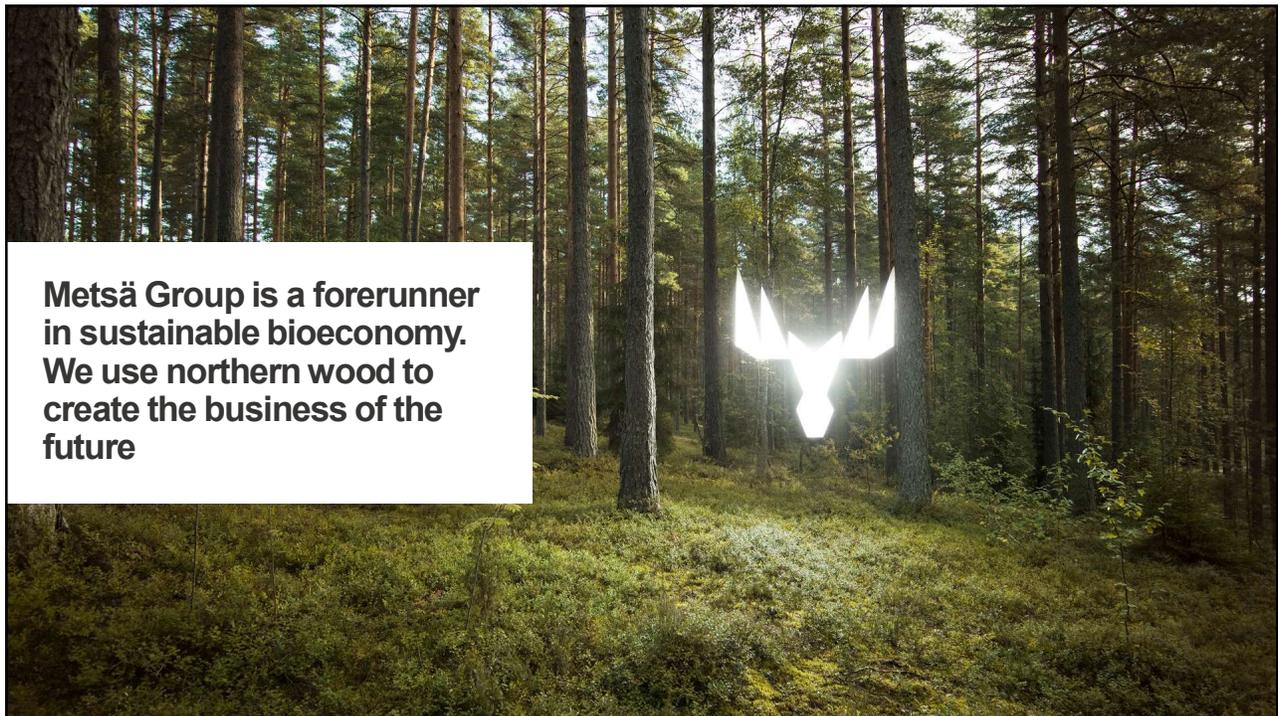


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Metsä Group's approach to education and training

Lasse Brandt
VP, HR, Metsä Fibre



Metsä Group is a forerunner in sustainable bioeconomy. We use northern wood to create the business of the future

Key figures 2018

* Internal sales eliminated
** Listed on Nasdaq Helsinki



3



Careers in Metsä Group

We offer a wide range of career paths and employ professionals in various fields

- Production units in 8 countries in Europe and operations in 30 different countries
- Significant employer also in sparsely populated areas

We have expertise in

- wood trade and forest management
- chemical and mechanical industrial production
- maintenance and wood processing technology
- other business support functions

● PRODUCTION
● SALES COMPANIES

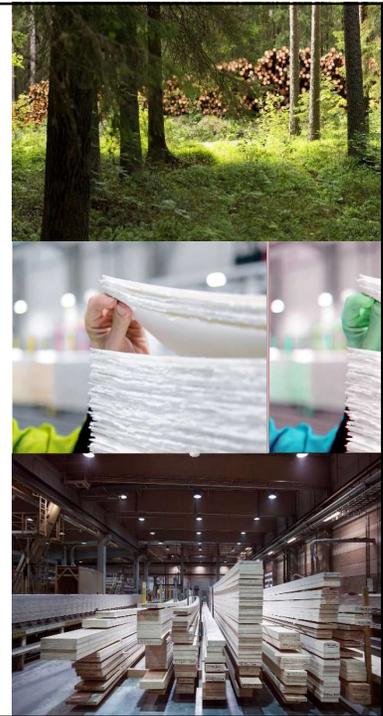


Metsä Group started pre-engineering related to three investments worth **EUR 2 billion in total**

- New bioproduct mill in Kemi
- New pine sawmill in Rauma
- First phase in renewing the Husum pulp mill in Sweden

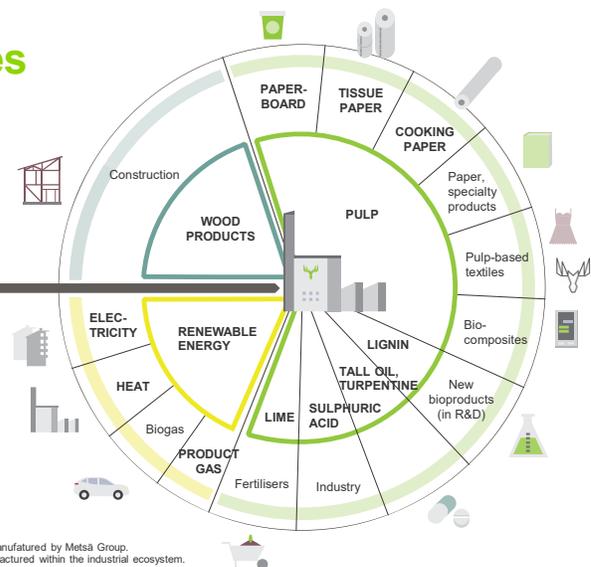
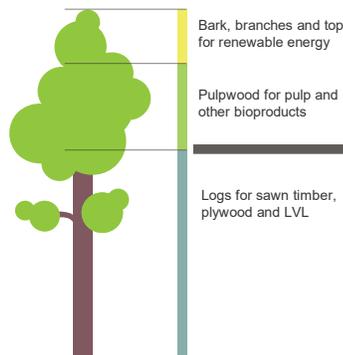
Investments would be implemented in 2020–2023 and they would have significant economic impacts in Finland

- Over EUR 0.6 billion increase in annual income, EUR 0.7 billion increase in exports
- Approximately 2,000 new jobs mainly in wood sourcing and logistics
- Construction phases' employment approximately 11,500 person-years
- Share of renewable energy in Finland would increase by approximately 2 %-units



5

Metsä Group is forerunner in circular bioeconomy – **Need for multiple competencies**

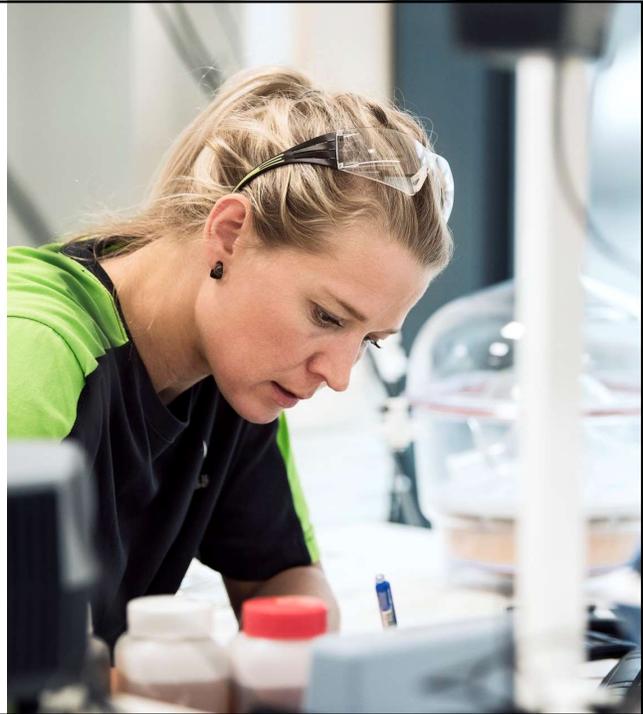


All products in **BOLD** are manufactured by Metsä Group.
All other products are manufactured within the industrial ecosystem.



Modern and developing forest industry

- The work in forest industry is continuously changing and evolving
- Metsä Group use the industry's latest and best technology, so the competence requirement level is rising
 - Automation and robotics are taking over simpler tasks, which offers interesting challenges for both our current and future specialists
- Investments, new bioproduct innovations and continuously development create the need for future professionals in different fields



7

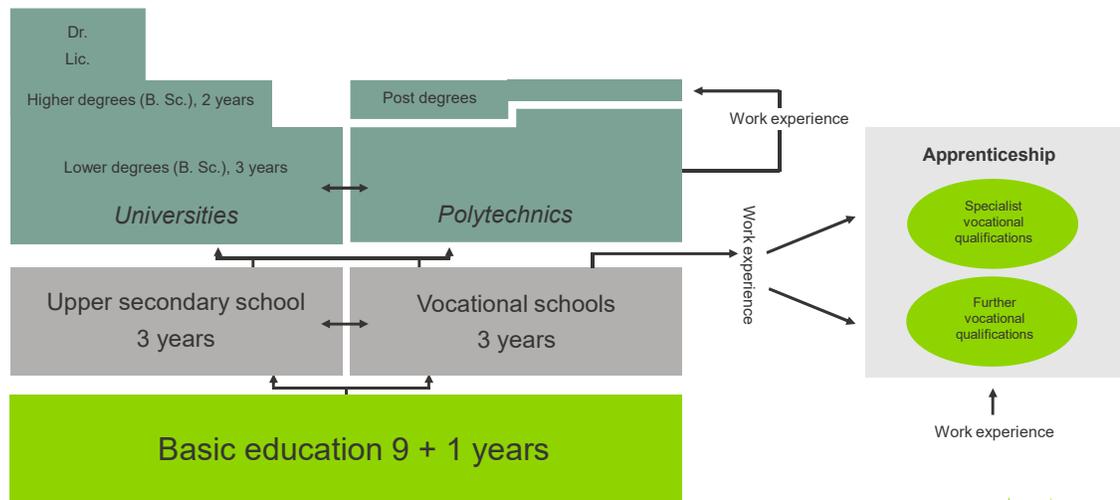
What kind of knowledge and skills we need?

- Mathematics and natural and technical sciences have a key role
- Employee autonomy and multiple skills are important nowadays
- Key competences alongside the process competence:
 - Safety and environmental know-how
 - Energy, material and environmental efficiency of processes
 - Customer knowledge and product development
 - Cooperation, communication and problem-solving skills
 - Ability and motivation to develop own skills



8

Finnish education system



9

Apprenticeship training in a nutshell

- Organized together with working places and educational establishments
- Leads to same vocational qualifications as in educational establishments
- An apprenticeship student works at least 25 h per week
 - Minimum requirement: 80% in the workplace and 20% in an educational institution
 - Duration of apprenticeship is 18 months
- Salary costs are only direct costs to employer
- Metsä Group has organised apprenticeship training since 2012



10

Benefits of apprenticeship training

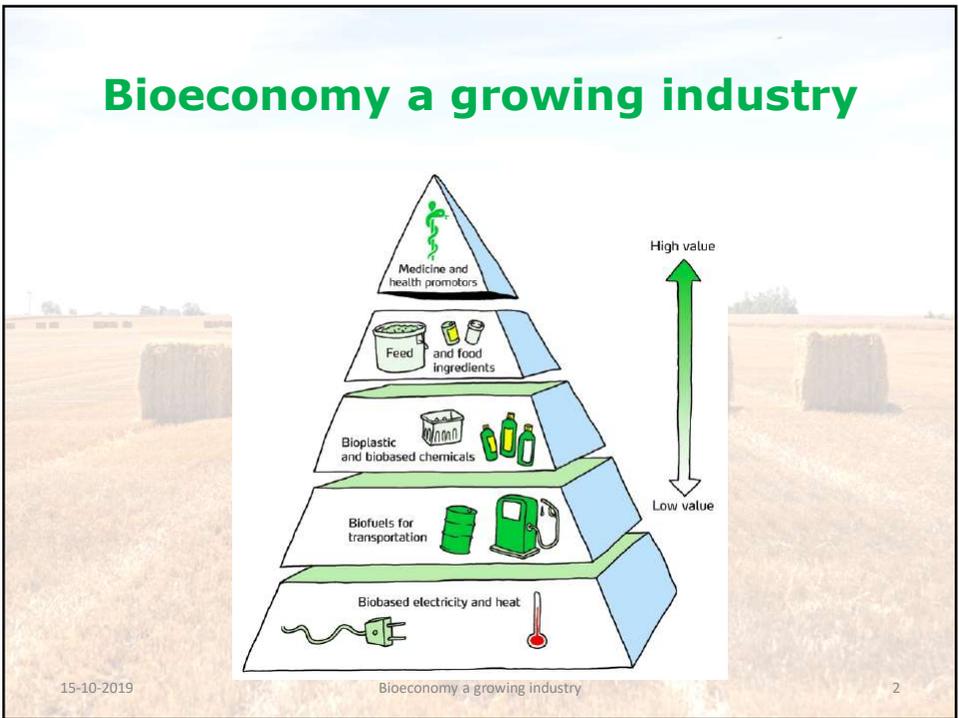
- Paid training which provides a great path to a career at forest industry
- Provides an opportunity to train professionals for company's future needs
- Training is carried out in the spirit of mentoring and is a form of mutual learning



11

Make the most of **Metsä**





Bioeconomy a growing industry

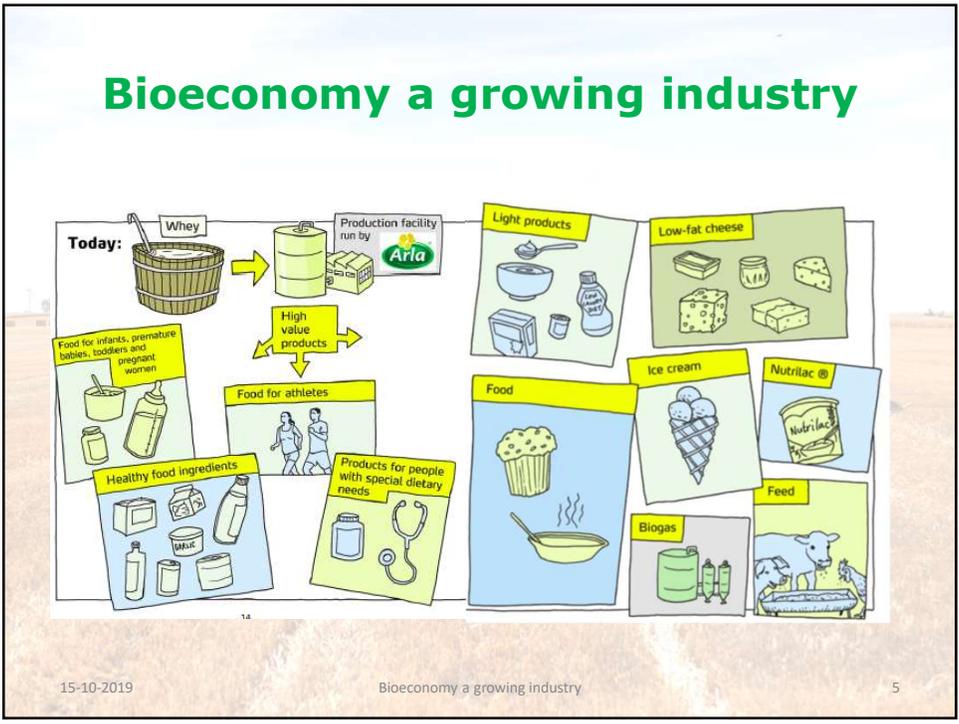
Why are EFFAT so interested in bioeconomy?

- We can see job opportunities
- Growth in the agriculture and food sector
- Innovation
- New kinds of job
- New kind of education

15-10-2019 Bioeconomy a growing industry 3

Bioeconomy a growing industry

15-10-2019 Bioeconomy a growing industry 4



Bioeconomy a growing industry

WASTE IS A RESOURCE

Waste is a resource, and how it is handled largely determines whether it can be recycled. Danish Crown is focusing its efforts on increasing the degree to which waste is sorted into recyclable waste fractions. This applies to plastic and cardboard as well as iron and other metals. We also want to use as much of the slaughtered animals as possible for food. By strategically exploiting the differences that exist in global food cultures, we can sell more of the pig and the cow for human consumption and thereby reduce the loss of animal proteins.

Objectives 2013-2018:

- To increase the use of biological waste, including the use of animal by-products, sludge and fertiliser.
- To increase the proportion of the waste which is reused, while taking account of the collection systems and recycling options in the various countries.
- To implement two to three projects on food waste per company per year.
- To implement two projects on minimising packaging each year for the slaughterhouse companies and five projects a year for the processing companies.

15-10-2019 Bioeconomy a growing industry 6

Bioeconomy a growing industry

The diagram illustrates a sustainable mussel farming system. On the left, a cross-section shows seaweed growing on a structure above mussels, which are suspended in the water column. Fish are shown swimming below the mussels. A current arrow indicates water flow. On the right, a circular flow diagram shows mussels being processed into products (green dots) and waste (brown dots), which are then used as feed for pigs and fish. Below this is a large pile of harvested mussels.

Mussel farming

15-10-2019 Bioeconomy a growing industry 7

Bioeconomy a growing industry

In order to **promote employment creation in the bioeconomy**, and to **ensure that workers have adequate skills for working in the bioeconomy**, trade unions and workers' representatives should:

6. Undertake initiatives aimed at:
 - a. Improving their knowledge of the implications of the bioeconomy in terms of employment and required skills of workers.
 - b. Improving awareness of, and general knowledge about bioeconomy among workers (e.g. through elaboration of informative material).
 - c. Helping unemployed workers to access technical education in the field of bioeconomy, with a view to improving their chances of finding a job in the related sectors.
7. Consider the possibility to **invest part of the financial resources available to them** (e.g. those related to workers' retirement funds) in initiatives aimed at **providing workers with technical education in the field of bioeconomy**, always with a view to improving their chances of finding a job in the related sectors.

15-10-2019 Bioeconomy a growing industry 8

Bioeconomy a growing industry

job creation in the
Rural Districts

15-10-2019 9

Bioeconomy a growing industry

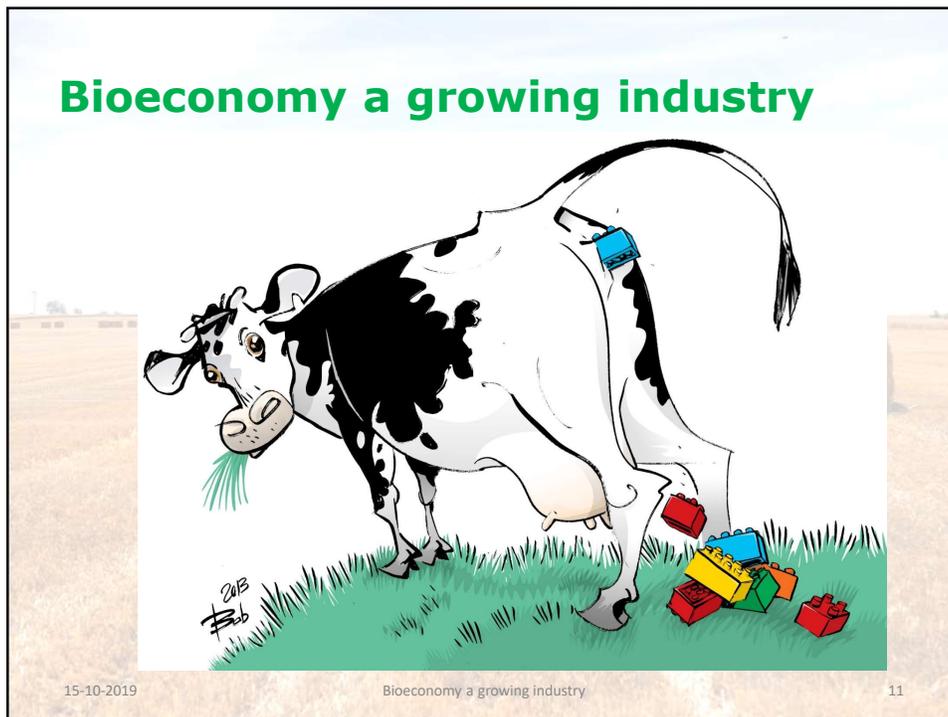
Bioeconomy a growing industry

Jobs in Bioeconomy?

- Today about 18 mio jobs in EU
- Norway expect 50.000 i seaweed in 2030
- Calculation from CE 2015 25.000 jobs DK
- Novozymes expect 3.2 mio jobs in rural areas world wide
- New kinds of job i.e growing insects industries
- Seestar production for animal feed (protein)

15-10-2019 10

Bioeconomy a growing industry







THE EUROPEAN
BIOECONOMY
NETWORK

WWW.EUBIONET.EU



BIOVOICES
CONNECTING BIO-BASED FORCES
FOR A SUSTAINABLE WORLD

EuBioNet: The importance of raising awareness at local and regional level: the role of the European Bioeconomy Network

Susanna Albertini - albertini@fvaweb.it

What is the European Bioeconomy Network?



- Initiated by the BIOVOICES project in March 2018 and launched in May, the European Bioeconomy Network (EuBioNet) is a proactive alliance of **47 EU funded projects** dealing with Bioeconomy promotion, communication and support.
- The main goal of the European Bioeconomy Network is to **maximise the efforts, increasing the knowledge sharing, networking, mutual learning, coordination of joint activities and events.**



www.eubionet.eu

What is the mission of the European Bioeconomy Network?



- increase the awareness of environmental, societal and economic benefits of Sustainable Circular Bioeconomy in Europe
- stimulate the debate, knowledge sharing and mutual learning to address bioeconomy related challenges and opportunity
- identify impact-oriented strategies to boost the sustainable circular bioeconomy in Europe
- design a joint and consolidated action plan of communication activities
- facilitate networking and collaboration between stakeholders
- support the MS and regions in developing awareness, communication and education activities on Sustainable Circular Bioeconomy



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The European Commission recognizes the importance of the European Bioeconomy Network!



- Shared the need of increasing cooperation among CSAs, hosting the Mobilisation and Mutual Learning workshop in meeting in March 2018
- The **update of the Bioeconomy Strategy** mentions the EuBioNet on page 84, 85 and 86 as a key player for promoting and communicating bioeconomy.
- High level conference launching the European Bioeconomy Strategy on 22 October in Brussels "Sustainable and circular Bioeconomy, the European way", EuBioNet organized the **bioeconomy corner**, showcasing several Bio-Based products.
- During the conference "Bioeconomy Scene 2019" the EuBioNet organized the official **satellite workshop** "The role of communication and education in promoting circular and sustainable bioeconomy at local, regional and national level" and the **BioART gallery** to showcase Bio-based products in the conference's lobby.
- Invite EuBioNet representatives to present the initiative in several high level conferences.



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How the EuBioNet deploys its activity?

THE EUROPEAN
BIOECONOMY
NETWORK

The European Bioeconomy Network deploys its activity through the 47 projects that are involved in the network.



How the EuBioNet deploys its activity?

THE EUROPEAN
BIOECONOMY
NETWORK

3 examples of how projects are implementing activities foreseen for the European Bioeconomy Network to address the actions stated in the updated European Bioeconomy Strategy:



BIOVOICES
CONNECTING BIO-BASED FORCES
FOR A SUSTAINABLE WORLD



HOW: Organizing 70 regional, national and international actors
Mobilisation and Mutual Learning events involving QH stakeholders to address the most relevant challenges for all bioeconomy sectors.
Implementing **awareness raising and communication activities** promoting the transition toward the bioeconomy.
Providing support to the regions in communication, education and stakeholders engagement activities.



biobridges



HOW: Promoting awareness, dialogue and collaboration between **Bio-based Industries; Brands and Consumers** to promote more sustainable production, consumption and lifestyles.



LIFT
Boosting bioeconomy by
maximizing CSAs results



HOW: **Mapping, Valorizing and making available the Actionable Knowledge** generated by the Coordination and Support Actions (CSAs) in Bioeconomy to Quadruple Helix stakeholders (Policy, Business, Research, Civil Society).

www.eubionet.eu

What are the EuBioNet main activities?

Thanks to the EuBioNet facilitation, more than **60 joint activities** and events took place. The following activities will continue to be implemented in 2019 and 2020:

- Promotion of stakeholders engagement and networking activities at European, National and Regional level
- Support the regions in communication, education and stakeholders engagement activities
- Co-organisation of events and focus groups to discuss the key challenges to be addressed for Bioeconomy
- Organisation of awareness raising activities in large scale events (Maker Faire, Researchers' Night, Bioeconomy Village, Bioeconomy corner at the Sustainable and circular Bioeconomy, the European way and Bioeconomy Scene 2019)
- Involvement as experts/speakers in Bioeconomy-related events (Workshops, Advisory boards, conferences, webinars)
- Increased impact of other project's outcomes (Promotion of events and activities organised by other members, dissemination of other members' project's results, matchmaking of similar activities) and the role of the EC in promoting the Circular Bioeconomy

THE EUROPEAN
BIOECONOMY
NETWORK

Case studies



www.eubionet.eu

Case study 1: Supporting Regions in the design of innovative bioeconomy educational paths



- **Context:** Lazio Region (IT) Startupper School Academy (developing entrepreneur skills for professional high school students)
- **EuBioNet activity:** Creation of the “Bioeconomy Prize” dedicated to ideas and projects dealing with bioeconomy. Delivery of dedicated training to teachers about bioeconomy and bio-based products. The winners exposed the product at researcher’s Night (Roma), Maker Faire (Roma), Science is Wonderful (Brussels). Demo Kits and 1500 Eur to the winning school (Novamont).
- **Projects involved:** BIOVOICES, Biobridges, LIFT
- **Companies involved:** Novamont
- **Impact:** 500 Schools, 20.000 students, 10 fab labs



www.eubionet.eu

Case study 2: Supporting Regions in the design of innovative bioeconomy educational paths



- **Context:** Friuli Venezia Giulia Region (Italy)
- **EuBioNet activity:** Supporting the region in the creation of the regional HUB for Bioeconomy Education. Co-organisation of a Mobilisation and Mutual Learning workshop with Quadruple Helix Stakeholders to identify educational needs (formal education, value chain actors education, other actors capacity building on bioeconomy).
- **Projects/initiatives involved:** BIOVOICES, LIFT, Biobridges, STAR-ProBio, European Bioeconomy University
- **When:** 26 November 2019 (Udine)



www.eubionet.eu

Get in contact with the European Bioeconomy Network

THE EUROPEAN
BIOECONOMY
NETWORK

Susanna Albertini

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www.eubionet.eu



www.eubionet.eu



Mapping exercise of bio-based industry needs

Aleix Barrera Corominas
Universitat Autònoma de Barcelona

 European Commission |
  Horizon 2020
European Union Funding
For Research & Innovation |
  BIO-BASED
INDUSTRIES
Public-Private Partnership |
  Bio-based Industries
Consortium

 **UrBIOfuture**
careers, education & research

CONTENT

1. Main Objectives
2. Methodology and Sample
3. Main Competences analysed
4. General Competences
5. By way of conclusion



 European Commission |
  Horizon 2020
European Union Funding
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INDUSTRIES
Public-Private Partnership |
  Bio-based Industries
Consortium

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MAIN OBJECTIVES

- Get information directly from the stakeholders in order to know how they see the current needs of their companies and also the expected needs in 2030.
- Information, which supports the UrBIOfuture project in understanding the GAPS between the industry needs and the delivered training programmes.
- Information, which helps the consortium to understand expert's perceptions of bio industry on 2030 and elaborate Guidelines to improve educational programmes.



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Methodology and sample



METHODOLOGY AND SAMPLE

Focus Group

5

Interviews

11

Number of participants: 38 (27 + 11)
Countries represented: Belgium, Denmark, Finland, Italy, Poland, Spain and Netherland.
Participants average profile:

- 65% of women
- Between 40 and 50 y.o.
- Over 15 years of experience in the sector
- Mostly in management positions

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METHODOLOGY AND SAMPLE

Survey

152

Countries represented: almost all European Countries.
Main sectors of activity:

- Biotechnology
- Agriculture
- Pharmaceuticals
- Chemical
- Food Products
- Biorefinery
- Bioenergy

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GENERAL COMPETENCES

- Management
- Data management
- Personal initiative and entrepreneurship
- Soft skills
- Sustainability and industry
- Technology

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accelerating the bio-economy

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GENERAL COMPETENCES

- Research and innovation
- Basic scientific knowledge
- Rules and regulation
- Social responsibility
- Sales and marketing

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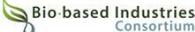




MANAGEMENT & DATA MANAGEMENT

MASTER MASTER

- Business model development
- Project Management
- Industrial linkers
- Quality
- Data analytics and advanced analytics
- Processing data
- Sensing technologies
- Exploitation technologies

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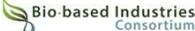
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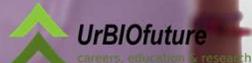


ENTREPRENEURSHIP & SOFT SKILLS

MASTER MASTER

- Critical Thinking
- Creativity
- Engagement capacity
- Teamwork – Conflict resolution
- Adaptability
- Collaboration
- Relationship building

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SUSTAINABILITY & STEM

UNDERGRADUATE MASTER

- Circular economy
- Sustainable competitiveness
- Ecological perspective
- Key enabling technologies
- Digital Skills
- IT and Communication
- Data mining tools

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Research and Innovation & Basic Scientific Knowledge

PhD

- Innovation and change
- Knowledge Transfer
- Research Management

UNDERGRADUATE

- Biotechnology
- Biology
- Chemistry

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Rules and regulations & Social Responsibility

MASTER

- Basic legal framework
- Common EU regulations
- Intellectual property rights

MASTER

- Environmental
- Ethics

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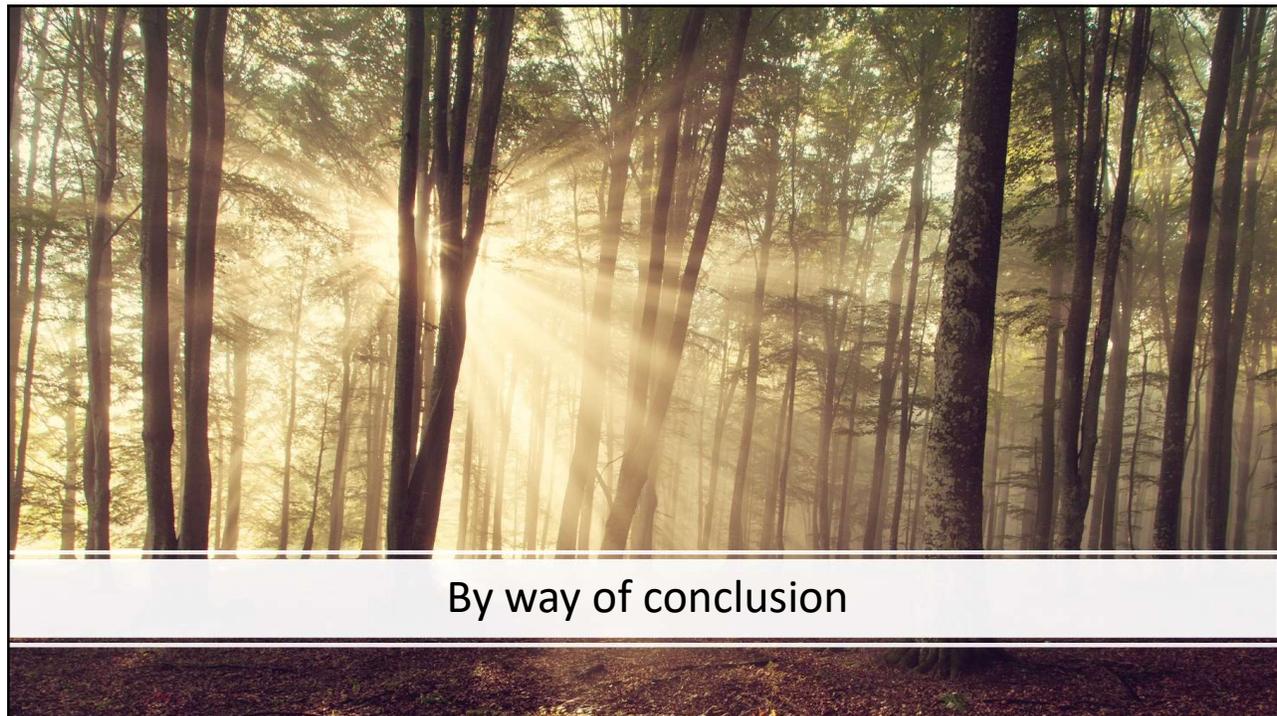
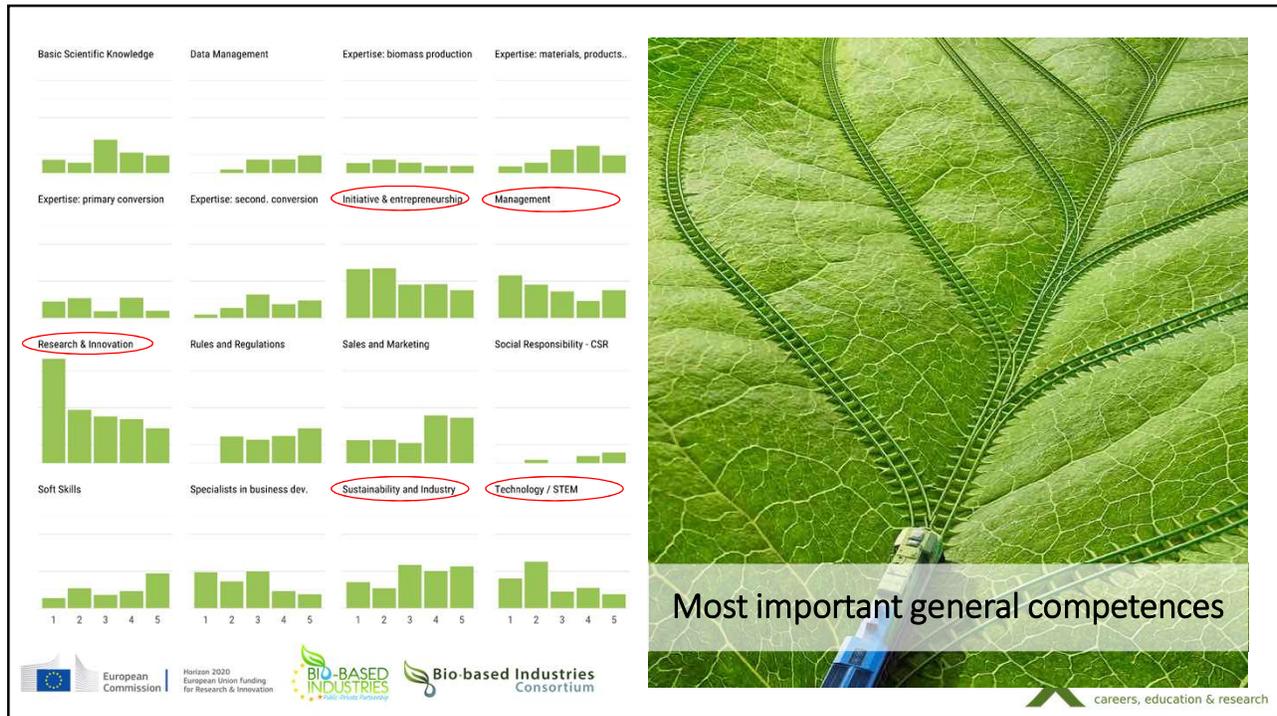
Sales and Marketing

MASTER

- Increasing product awareness
- Adapting products
- Market Globalisation

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CONCLUSIONS

- Need of professionals with Master Degree.
- Professionals with the skills to transfer LAB ideas to the industry.
- Focus on sustainability, circular economy and value chain.
- Key role of personal initiative and entrepreneurship.
- Importance of Research and Innovation
- Collaboration between industry and educational system.



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Programmes

912

MAIN PRODUCTS

Report about the analysis of educational gaps identified in the different regional contexts and action fields

UrBIOfuture Experience



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Preliminary mapping exercise of bio-based industry needs

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Rethink Resource



Linda Grieder

15.10.2016



Our Company

RethinkResource GmbH

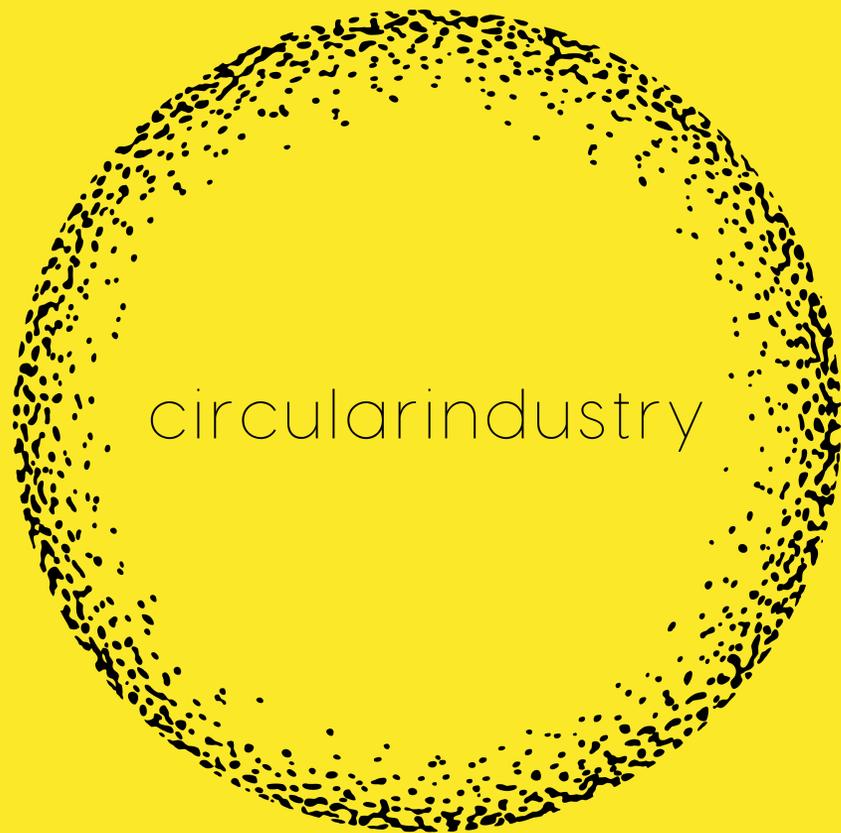
RethinkResource works as an Innovation Agency and Strategy Consultancy to industrial producers, brand owners and associated companies in all matters related to Circular Economy and the use of industrial side-stream materials. The main modes of operations are:

- **Product Development and Innovation Management** in publicly funded consortia or privately funded "innovation ecosystems"
- **Strategy Consulting** in Circular Economy matters for large public and private organizations of any size
- **Additional Services** include talks, Circular Economy workshops, educational seminars and innovation scouting



Our Association

circularindustry



circularindustry is an association with the purpose to promote Circular Economy related collaboration and activities in the producing industries. Its members come from the private sector with a particular focus on industrial production, but also include i.e. technology institutions and service providers. circularindustry provides two main types of services for its members:

- **Circular Academy:**
Various educational offerings on a personal level to advance competencies and skills related to driving Circular Economy in the private sector.
- **Cooperation-Network:**
A project-based cooperation platform that offers a structured approach to open / collaborative innovation, providing a neutral intermediary and process to streamline and drive systemic change in projects that go beyond the reach of individual members.



Challenges the circular bio-economy faces

Why is a transition difficult?

Hurdles for a transition to a circular economy may arise from:

- knowledge gaps,
- conflicting interests,
- established habits,
- lack in available financing,
- missing incentives to invest
- lack in access to secondary materials,
- and/or perceived lack of consumer demand.

Crucial factors for the transition:

- right motivation (strong responsibility to society / less to shareholders)
- willingness to invest
- readiness to assume risk
- access to know-how and technology



Skills the circular bio-economy needs

Facilitating the transition and empowering next generations

Especially family-owned companies, start-ups and B-Corps are very progressive and follow the **right motivation**. Also **generation changes** are currently a key factor, accelerating the shift of thinking within companies.

Key skills needed for a shift of thinking:

- intrinsic understanding for the **value “waste”** still carries (perceiving it as a resource, not worthless)
- impulse for holistic approaches (focus on **systemic thinking**, not single point optimizations)
- **cross-sectoral, cross-industrial** and **cross-generational** dialogue and collaboration between different actors in the society (businesses, NGOs, policymakers and society)
- seeing its **responsibility to society** and to the environment

Speaking from experience, having worked together with many small, family-owned, multi-national, local and global companies, we believe, that this shift of thinking will bring along all the “fine motor skills” needed to successfully transition to a circular economy. How can this shift of thinking be achieved?

- incentives from policy makers
- dialogue and collaboration
- incentivize first-movers